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clintonbastin <clintonbastin@email.msn.com> on 09/07/2001 08:25:42 AM

To: YMP_SR@ymp.gov
cc: the.secretary@hq.doe.gov, gail.marcus@hq.doe.gov, lake.barrett@hq.doe.gov, "Mal McKibben/Tina Frazier - CNTA" <CNTA@mindspring.com>, mel.buckner@srs.gov (bcc: YMP_SR)

Subject: Supplementary Comments on Possible Site Recommendation for Yucca Mountain

Part of Records Package / Supplement / Correction

The August 28 letter from Lake Barrett suggested an outline of topics for use in commenting on the possible recommendation by the Secretary of Energy to the President of the Yucca Mountain Site in Nevada for development as a spent nuclear fuel and high-level nuclear waste (HLNW) geologic repository. Comments submitted in my letter to you of August 31 are supplemented by those in the attached file to conform to that outline.

Best wishes for success in your challenging and important mission!

Clinton Bastin

 - att1.htm

 - yuccamtnsept01.wpd

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Clinton Bastin, Chemical Engineer (Retired) United States Department of Energy (USDOE)
987 Viscount Court, Avondale Estates, Georgia 30002
Telephone 404 297 2005; E-Mail clintonbastin@msn.com

September 7, 2001

Carol Hanlon, USDOE
Yucca Mountain Site Characterization Office
M/S 025 - PO Box 30307
North Las Vegas, Nevada 89036-0307

Dear Ms. Hanlon:

Supplementary Comments on "Possible Site Recommendation for Yucca Mountain"

The August 28 letter from Lake Barrett suggested an outline of topics for use in commenting on the possible recommendation by the Secretary of Energy to the President of the Yucca Mountain Site in Nevada for development as a spent nuclear fuel and high-level nuclear waste (HLNW) geologic repository. Comments submitted in my letter to you of August 31 are supplemented by the following to conform to that outline:

1. The site evaluation and other scientific documents produced by the Department provide an adequate basis for finding that the Yucca Mountain site is suitable for development of a repository for long term isolation of HLNW, with the specific understanding that HLNW is defined as the unwanted fission products and other unwanted materials remaining after virtually complete removal of all (99.8+%) fissionable (energy or weapons usable) materials from spent nuclear fuels. The documentation does not provide an adequate basis for a determination that the site would be suitable for a repository for spent nuclear fuel, because the proliferation/diversion threat and safeguards challenge associated with weapons usable material contained in the spent nuclear fuel have not been addressed. Moreover, it would not be possible to provide safeguards for weapons usable materials for the time period needed for full decay - hundreds of thousands to millions of years. Spent nuclear fuel could be easily retrieved from the repository after a few hundred years decay of intensely radioactive fission products. Plutonium could be recovered with very simple chemical processes in unshielded equipment and used to make a nuclear explosive which could be detonated for destructive purposes. The adverse environmental consequences would be many orders of magnitude beyond the slight increase in radiation exposure to humans from materials stored in the repository. Thus a repository for disposal of spent nuclear fuel, at Yucca Mountain or anywhere else, would not be a responsible action. In addition, disposal of spent nuclear fuel denies the enormous potential for non-atmospheric polluting, non-greenhouse gas producing energy from efficient use of nuclear materials. Letters in the National Academy of Sciences publication *Issues in Science and Technology,* Summer 1994 (Enclosure 1) and *Science*, August 18, 2000 (Enclosure 2) provide further information.

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2. The Yucca Mountain site probably meets the applicable radiation protection standards of EPA and NRC for disposal (isolation) of HLNW. However, there has been increased emphasis on the integrity of the engineered containment for high level waste, as opposed to the inherent geologic features of the site. This suggests a change in approach, namely, to an engineered, rather than a geologic repository. An engineered repository should be built on the site where HLNW is produced, i.e., at the reprocessing site. If the Yucca Mountain site is suitable for reprocessing and political leaders of Nevada endorse such use, the Secretary should recommend this site to the President.

3. There is no reason that should prevent the President from concluding that the Yucca Mountain site is qualified for the preparation and submission of a construction license application to the Nuclear Regulatory Commission for a repository for HLNW as defined in (1) above and subject to conditions in (2) above.

4. The Secretary should not recommend development of a repository at Yucca Mountain until suitability of the site for reprocessing is determined, and then only for an engineered repository for HLNW as defined in (1) above. The mechanism proposed in the following discussion for utilization to meet the Department's legal obligation to begin accepting spent nuclear fuel and HLNW has a precedent, namely, that of the US Atomic Energy Commission (AEC) when it cancelled its success-based program for disposition of spent nuclear fuel in favor of commercial reprocessing with its failure-based reprocessing technology. The AEC accepted responsibility for spent nuclear fuel at reactor sites, specifically, at Dresden I and Yankee Rowe, pending availability of the commercial reprocessing site. The Department should accept responsibility and provide funding for dry cask storage of spent fuel at nuclear power plant sites, pending the availability of spent fuel storage facilities at Department sites that are suitable for reprocessing and recycle of spent nuclear fuel. Vitrified HLNW at the West Valley site should be stored on site until availability of an engineered repository for high level nuclear waste at a Department site. The State of New York initially accepted responsibility for long term isolation of HLNW, thus shares joint responsibility with the Department for isolation of wastes there, pending its shipment to another site. HLNW at Hanford should be stored in tanks indefinitely or in soils of the vadose zone, in accordance with decisions in the early 1950s that the Hanford site would be a permanent repository for HLNW. Vitrified HLNW at SRS should be stored on site pending likely construction of an engineered repository there. The small amounts of calcined HLNW at Idaho should continue to be stored in bins.

5. Spent fuel must be disposed of by reprocessing and recycle of all fissionable materials in well conceived, well-designed and safeguarded facilities, in a manner that avoids the accumulation of accessible (separated) weapons materials. The Spent LWR Fuel Recycle Complex designs of DuPont in 1978 provide a model for such facilities. HLNW should be disposed of by isolation in well-engineered repositories at fuel recycle sites. Department sites at Hanford, Idaho and Savannah River are suitable for reprocessing, recycle and HLNW isolation, and should be used for these purposes. The Yucca Mountain site may also be

suitable.

6. There are two major problems that must be corrected if we are to have appropriate management of spent nuclear fuel and HLNW in the United States; both are the result of gross, uncorrected misinformation. The first was by the AEC, in 1957, that overstated productivity of its low-cost, pilot plant reprocessing technology by a factor of almost thirty and led to the use and export of that technology, and a model for other nations to follow. The technology was suitable for nuclear proliferation (demonstrated by India), but totally inadequate to support nuclear power (demonstrated at the West Valley site and in fact had been demonstrated earlier at AEC's Idaho site as inadequate to support material production for nuclear deterrence). The AEC in its final year attempted to correct major problems resulting from its earlier mistake, but leaders of the Energy Research and Development Administration and later the Department embraced failure-based and rejected success-based reprocessing technology and did not provide clarification to US citizens and their leaders of the root cause of the problem, nor of the difference between success and failure based reprocessing technology. The myth that well managed reprocessing is a proliferation threat developed from failure of nuclear program leaders to explain what had happened, and is reinforced by technical personnel at the Department's laboratories who want to perform research on so-called proliferation-resistant fuel cycles. Proliferation-resistant reprocessing is the result of good design by competent, experienced organizations who have good understanding of all aspects of reprocessing (i.e., that by DuPont in 1978), and is essential to best nuclear non-proliferation practice. In addition to the sites, the Department (or the nuclear power industry) will need a competent corporation to carry out these responsibilities.

   The other problem is that major funding is being provided for so-called "nuclear waste cleanup" at major Department sites. The major justification for this funding was false allegations by anti-nuclear activists of the dangers of nuclear wastes at these sites. The Department had very credible information to correct the gross misinformation but did not do so. Now political leaders in states and communities where the sites are located, and workers and contractors at the sites, appreciate funding for the jobs and profits, and often parrot the misinformation to justify continuing expenditures - which provide little benefit other than the jobs and profits. Thus there is little community or state support for change to missions that will provide benefits to Americans. If the Department is to be successful in using its sites for benefit, it must begin providing full and accurate information about nuclear technology to all Americans, and quickly correcting misinformation - particularly false allegations of danger of nuclear technology.

I appreciate your consideration of these comments and would be pleased to provide additional information or clarification. Best wishes for success with your important and challenging mission.

Sincerely

Clinton Bastin

Enclosures: 1. *Issues in Science and Technology,* Summer 1994, "Nuclear Waste"
2. *Science*, 18 August 2000, "Nuclear Power and Climate without Proliferation"

List of recipients:

The President, The White House
Honorable Spencer Abraham, The Secretary of Energy
Lake H. Barrett, Acting Director, Office of Civilian Radioactive Waste Management, DOE
Honorable Dennis Hastert, The Speaker of The House of Representatives
Honorable Tom Daschle, The Senate Majority Leader
Dr. Gail Marcus, President, American Nuclear Society